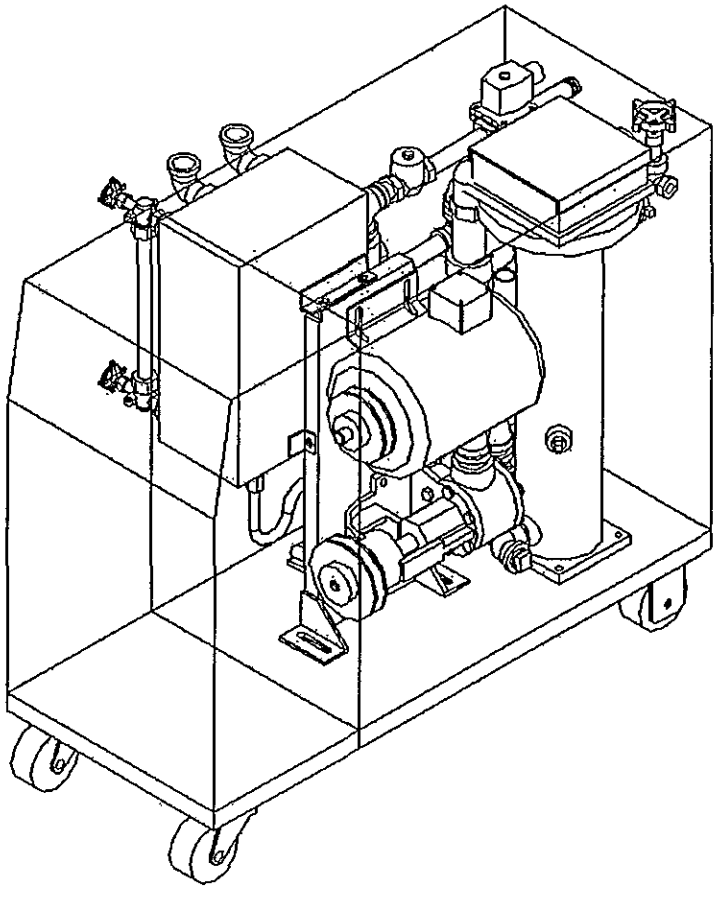
STERLCO TEMPERATURE CONTROL
SERVICE AND INSTRUCTION MANUAL

THIS MANUAL PERTAINS TO:

6010

Compact Oil Unit

Revision 2
February 4, 2000



Engineered and Manufactured by INDUSTRIAL CONTROLS DIVISION
STERLING, INC.
5200 West Clinton Avenue, P.O. Box 23435, Milwaukee, Wisconsin 53223-0435
Manufacturers of Temperature Control Equipment Since 1916

Please note that our address and phone information has changed. Please reference this page for updated contact information.

⚠CAUTION These manuals are obsolete and are provided only for their technical information, data and capacities. Portions of these manuals detailing procedures or precautions in the operation, inspection, maintenance and repair of the products may be inadequate, inaccurate, and/or incomplete and shouldn't be relied upon. Please contact the ACS Group for more current information about these manuals and their warnings and precautions.

Parts and Service Department

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

For immediate assistance, please contact:

- North, Central and South America, 8am – 5pm CST +1 (800) 483-3919 for drying, conveying, heating and cooling and automation. For size reduction: +1 (800) 229-2919.
  North America, emergencies after 5pm CST (847) 439-5855
  North America email: acsuscanadacustserv@corpemail.com
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Our products are sold by a worldwide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.

For assistance with your sales or system contracting needs please Call:
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CONGRATULATIONS !

You are the proud owner of a Sterling Temperature Control System - the finest, most dependable unit available in today's market. Your Sterlco unit represents over 40 years of proven field service. We, at Sterling, are dedicated to manufacturing a temperature control unit that is second to none. Built by skilled craftsmen with the most modern and precise machinery available today. The simplicity of design and compactness engineered into the unit result in less maintenance and less floor space.

The Sterlco High Temperature Control Unit; designed and tested over a period of many years, represents one of the most significant advances ever in the field of self-contained, closed systems - portable units for heating synthetic fluid and circulating it at controlled temperatures - through mold, rolls or jackets of processing equipment.

This owners manual is intended to provide a complete overview of the unit and to give you step-by-step guidelines for the safe operation, care and service of your unit. We recommend that you thoroughly read this manual before initial start-up of the unit. This manual covers standard single and dual zone heating, cooling and circulating, with one delivery and one return line, per zone plus a water supply line and drain line for cooling.

These standard units may have many variations of optional features added to them, relative to the customer's application or specific desires. The illustrations used are to help you identify certain parts by names and to understand our explanations, which will assist you later on in the Trouble Shooting sections.

Units are warranted against defects in materials and workmanship for one year from date of shipment. Any Sterlco unit which has been used contrary to specific operation instructions or materially altered, will not be covered by this warranty. Final determination of defects must be made at Sterling Inc.

The units can easily be moved from location to another, simply by removing the circulating connection lines. By following the instructions in this manual and treating your equipment with care and respect due any precision equipment, you will be rewarded with years of uninterrupted, trouble free service.

CAUTION! THIS EQUIPMENT MUST NOT BE USED WHILE UNATTENDED!

CUSTOMER SERVICE

Your unit was engineered and carefully assembled to give you excellent quality and years of trouble free operation. However, if an unknown condition occurs, Sterling, Inc. has a well trained customer service group to assist you. We suggest the following to request quick service:

CONTACT STERLING, INC.

The Customer Service Group is available from 7 AM to 6 PM (CST), Monday through Friday. The numbers to call are:

(800) 783-7835
(414) 354-0970
Fax #: (414) 354-6421

Before you call, be sure to do the following:

1. Refer to the "Troubleshooting" section of this manual.
2. Be sure to have this manual in front of you when you call.
3. Write down the symptoms or problem that you are experiencing.
4. Have your unit's model number and serial number available when you call.

STERLING RETURN GOODS AUTHORIZATION (RGA)

In order to better serve our customers' needs, we would ask that before returning material or equipment of any kind, for any reason, to call Sterling at 1-800-783-7835 for a return goods authorization number (RGA). This is an mandatory policy to help us identify return goods, the reason for their return and to help Sterling expedite their processing. Failure to obtain this RGA # and mark it on the goods may result in their immediate return at your cost without being processed.

We thank you for your cooperation and understanding.

FLUID HEATING

Heating of the fluid is accomplished through the specially designed low watt density electrical immersion heater inserted into the heater tank. The immersion heater temperature is controlled by a micro-processor based controller located on the front of the control panel. A safety thermostat is installed on the heater tank for overtemperature protection. The safety thermostat is wired with its own circuit completely separated from the control system.

Models are supplied with a 6 kw, 3 phase low watt density immersion heater; activated by a mercury contactor. A 3" heater tank is used for the 6 kw immersion heater.

KW ratings of immersion heaters are rated at the following standard voltages:

208V, 240V, 380V, 415V, 480V, 600V

6kw	20,490 BTU/hr.

PUMP

6 GPM @ 50 PSI

Circulation of the fluid is controlled by a slow speed, high temperature, positive displacement pump with a mechanical seal, which is belt-driven by the electric motor. It may be supplied with a packed pump as an option with an additional option of adding a drip return pump.

A field installation kit of a Drip Return Pump for units that were originally supplied with a drip pan only is available through the customer service department.

COOLING

A specially designed shell and tube type heat exchanger of copper nickel is provided as standard equipment in these units. The standard size offered is approximately 1.5 sq. ft. in surface area.

FUL-FLO VALVE

This valve is a safety device that will open and divert the fluid back into the return line in the event the delivery line has been obstructed and the pressure in the line exceeds the set pressure on the pressure gauge.

CIRCULATING CONNECTION LINES

Units are equipped with heat exchangers. A water supply line rated at 65 PSI maximum is required and a drain line is necessary.

CAUTION! The drain line should be directed away from personnel and flow directly into an open drain. This drain line must not have any back pressure or obstructions.

Requirements for water connections are:

SUPPLY	DRAIN
1/2	3/4

Delivery and return lines of the unit are 3/4" male pipe threads. These lines are located at the back of the unit.

Sterling, Inc. stocks the recommended types of Flexible Metal Hoses in many lengths. Our P/N is 572-16969. Please state length requirements when ordering. Hoses must be adequate to withstand the maximum temperature and pressure at which the unit is to be operated. Hoses, fittings and channel connections in the mold or other equipment being controlled should be at least 3/4" in order not to restrict the flow of fluid through the circuit; if the flow is restricted by small connecting hoses or hoses with excess bends, loops, etc., the pressure relief valve will open and the flow through the circulating lines will be reduced.

In order to eliminate any back pressure, it would be advisable for all ports, connections, and hoses in the circulating lines to be sized equivalent to 3/4" pipe. Several parallel runs are far more practical than one long serpentine run and in many cases, can make a difference between precise control and erratic operation.

CAUTION! PROLONGED OR REPEATED EXPOSURES TO VAPORS GENERATED AT HIGH TEMPERATURES OR INHALATION OF HARMFUL AMOUNTS OF MATERIAL MAY RESULT IN EYE AND RESPIRATORY TRACT IRRITATION.

NOTE: GENERAL (MECHANICAL) ROOM VENTILATION IS SATISFACTORY FOR USE AT LOW TEMPERATURES. SPECIAL LOCAL VENTILATION IS RECOMMENDED AT POINTS WHERE VAPORS CAN BE EXPECTED TO ESCAPE INTO THE WORKPLACE.

VENT CONNECTIONS

On the side of the unit are a Fill connection and a Vent connection. At higher temperatures where liquid may give off appreciable vapors or fumes, adequate ventilation should be provided on connection. This vent connection must not be closed at any time. If a long vent is required, it is suggested that the vent be trapped near the exit to collect moisture that can develop on the vent when the unit is cooled.

VALVES

The Check Valve eliminates the back flow of water from the heat exchanger back into the water supply line.

The Blow-Off Valve is used in "VENTING" the unit and allows the air in the system to escape.

The Drain Valve is used to completely drain the entire unit of fluids. A hose line or a pipe can be connected to the valve and directed to a container.

The Pressure Relief Valve is rated at 150 PSI and its function is to protect the heat exchanger. If the raw water drain line is restricted and the pressure exceeds 150 PSI, the valve will open up to release the pressure in the line. As soon as pressure returns to normal, the valve will close.

SAFETY THERMOSTAT

The Safety Thermostat is mounted on the side of the heater tank. This Safety Thermostat is factory set and acts as a protection against overheating by de-energizing the safety contactor.

PERFORMANCE

The unit has four basic electrical controls, plus a pressure gauge and a temperature controller:

STOP BUTTON

When this button is depressed, power is removed from the start button. The unit will neither heat nor cool, and the pump will shut down if running.

START BUTTON

When this button is depressed, the starter is manually energized and supplies power to the motor, which in turn applies power to the "COOL-OFF-AUTO" switch.

COOL-OFF - AUTO SWITCH

When this switch is in the COOL position, the cooling solenoid will open, allowing water to flow through the heat exchanger. When in the AUTO position, the controller heats and cools as needed.

PRESSURE GAUGE

This pressure gauge has dial readings in pounds per square inch pressure. The red arrow is set to indicate pressure at which the Ful-Flo Valve is fully open. The black arrow indicates the actual pressure the pump is developing.

INITIAL PROCEDURES

This unit is supplied for 3-phase operation for a selected voltage. Caution must be taken to provide a correctly sized power supply to the unit. This unit must be properly grounded.

All electrical connections must be secure and should be checked before starting.

ELECTRICAL

It will be necessary to drill a hole in the cabinet for a power supply line.

HEATER CAPACITY EACH CIRCUIT KW	TOTAL AMPS 230/3/60	TOTAL AMPS 460/3/60
6 KW	17	8

FILLING THE TANK WITH FLUID

The expansion tank holds 2 gallons of fluid. The internal piping and the heater tank requires 1 gallon of fluid. Additional fluid should be added to fill the connecting lines, plus the channels in the process. As the unit is operating in the heating cycle, the fluid expands. Caution must be taken to never over fill the tank. Maintain 1" to 2" of fluid visible in the sight glass. This will allow for thermal expansion of the fluid.

CIRCULATION

FLOW DIAGRAM (HEATING AND COOLING)

HEATING

The fluid is drawn down to the pump by gravity feed; as the fluid is circulated through the pump, a pressure will be indicated on the pressure gauge. The fluid travels into the bottom of the heater tank where it is heated by the immersion heater to the temperature requirements set on the temperature controller. As the pressure builds up on the pressure gauge and fluid reaches the top of the tank, the heat sensor indicates the temperature on the temperature controller. The fluid is forced into the shell of the shell and tube heat exchanger and into the process delivery supply connecting line and circulated through the process.

NOTE: If the pressure in the line is greater than the set pressure on the pressure gauge, the fluid will by-pass the delivery to the process supply and will be diverted through the Ful-Flo (Safety Valve) back in the return line. As the fluid is circulated through the process, the fluid cools down slightly and is returned from the process to the return line into the pump and recirculated back into the heater tank.

NOTE: It is very important that the sight gauge glass indicates that there is an ample supply of fluid contained in the fluid expansion tank, an inch or two visible in the sight gauge glass is sufficient after the unit is properly purged.

COOLING

If the fluid temperature is higher than the controller set point the cooling solenoid valve will open allowing water to pass through the heat exchanger. The hot fluid will flow the same way as in the heating cycle, except that the heater will be disengaged and the solenoid valve will be activated and water from the water supply line will flow through the solenoid valve and check valve into the top of the heat exchanger, through the cooling tubes and cooling the hot fluid circulating around the cold tubes. The circulation of water is then routed out through the water drain line.

PRELIMINARY OPERATION

START-UP PROCEDURES

1. By means of hard piping or copper tubing connect a vent line from the blow off valve to the vent fitting on the reservoir tank.

2. Close the Return Line Valve.

3. Open Blow Off Valve.

4. Turn the heater selector switch to "OFF".

5. Depress the "START" switch to start the pump. Check motor rotation by observing the pressure gauge. If indicating pressure, rotation is correct. If indicating vacuum, reverse two motor power connections.

6. If there is any air in the lines it will come out of the Blow Off Valve.

7. Allow the unit to run for a brief period to ensure complete circulation. Watch the flow coming out of the Blow Off Valve for bubbles or erratic flow.

8. When the fluid runs steadily, close the Blow Off Valve.

9. Open the Return Line Valve.

10. Recheck the Sight Gauge Glass for fluid level (approximately 1" in glass is sufficient when fluid is at ambient temperature).

11. Position "COOL-OFF-AUTO" switch to the "AUTO" position.

CAUTION! THIS EQUIPMENT MUST NOT BE USED WHILE UNATTENDED.

MANUAL COOL

After the unit has been operating in the heating cycle for a length of time and a fast cool down of the fluid is required:

1. Position the "COOL - OFF - AUTO" switch to "COOL". This will over-ride the temperature controller and provide continuos cooling until the switch is reset.

RETURNING FLUID TO TANK – WITH OPTIONAL PUMP REVERSE

If the unit is to be moved from one process to another, the following steps must be taken:

1. Cool fluid to room temperature.

2. Close the Return Line Valve.

3. Open the Blow-off valve to allow air to enter the system.

4. Select "REVERSE" with the direction selector switch and push the start button. The pump will then run in reverse, draining the fluid from the process and into the delivery line.

5. The pump then circulates the fluid in this reverse direction into the expansion tank.

6. Watch the sight gauge glass as it fills, indicating how much fluid has returned into the expansion tank.
7. Push the "STOP" button, to stop the pump.

CAUTION! EXPANSION TANK MAY NOT HAVE ADEQUATE VOLUME TO HOLD TOTAL SYSTEM CAPACITY.

PREVENTATIVE MAINTENANCE

Periodic inspection of the following equipment must be made to maintain optimum performance of your Sterlco Temperature Control Unit.

CHANGING FLUID

CAUTION! FLUID MUST BE AT ROOM TEMPERATURE PRIOR TO CHANGING.

The fluid will eventually lose its clarity and begin to darken. This change in color is a normal reaction. The fluid should last from one to three years or longer, depending upon operating temperatures. The viscosity increase (thickening) indicates an accumulation of soluble decomposition products. Prolonged use of thickened fluid will result in malfunctions of the entire system. When viscosity has increased 30 - 35 %, the fluid should be discarded and new fluid added.

Should the user choose to disregard our recommendations, we cannot assume any responsibility for the successful operation of the system or any damage or malfunction that may occur.

The fluid is contained in the expansion tank which holds approximately 2 gallons. The internal piping and the heater tank require about 1 gallon of fluid. Additional fluid should be available to fill the connecting line, plus the channels, etc.

With the system purged and properly filled, only 1" to 2" should be visible in the sight gauge glass. This provides capacity in the expansion tank for expansion and for fluid when the pump is reversed and fluid is withdrawn from the system.

CAUTION! EXPANSION TANK MAY NOT HAVE ADEQUATE VOLUME TO HOLD TOTAL SYSTEM CAPACITY.

MOTOR

1. Clean out the motor air intake grill of dust and any oil accumulation.

2. Check the bolts and nuts that hold the motor to the support.

3. Make certain that the belts are in good condition and are aligned with the pump. Replace if necessary.

PUMP

1. It is good practice to keep the pump as clean as possible. This will facilitate inspection, adjustment and repair work and help prevent omission of lubrication to fittings covered or hidden with dirt.

2. Check the bolts and nuts that hold the pump to the support.

3. Under normal operating conditions, the pump packing (if the option was selected) should allow a drop or two of oil per minute. The packing is of the finest type available for this service and it depends upon a small amount of oil flow for lubrication. When the new unit is first started, the packing should be checked periodically and tightened as the pump wears in. Do not over-tighten the packing gland to a point where the pump will not drip. This will shorten the life of the packing and will damage the shaft.

WARNING! DO NOT MAKE ADJUSTMENTS TO THE PACKING UNTIL AFTER IT HAS BEGUN TO DRIP. IT MAY TAKE SEVERAL DAYS FOR THE FLUID TO START DRIPPING FROM THE PACKING. ONCE THE DRIPPING HAS BEGUN, THE RATE NEED NOT EXCEED 1 DRIP PER MINUTE AT OPERATING TEMPERATURE. IF UNIT IS EQUIPPED WITH DRIP PUMP, INSTALL BELT AFTER DRIPPING HAS STARTED.

4. Mechanical seal pumps should not leak. Leaking on this type of pump indicates a defective seal and the seal should be replaced.

5. Grease motor zerks after 500 hours of operation or after 60 days, whichever comes first. Grease the pump zerks with high temperature grease, Dow Corning #44.

VENT CONNECTION

Check to see if vent connections are open at all times.

DRAIN LINES

Check outlet of drain line for any obstructions or back pressure.

DRIP PAN

Clean any fluid, dust, or dirt accumulation from pan.

FLUID

1. Check the fluid for viscosity. Prolonged use of thickened fluid will result in malfunction of the entire system.

2. Check level of fluid in the sight glass.

3. If fluid level decreases, check all connections for leaks.

HEAT EXCHANGER

1. Keep exterior of the heat exchanger clear of dust or dirt.

2. Check water supply for correct pressure, leaks, etc.

STRAINERS

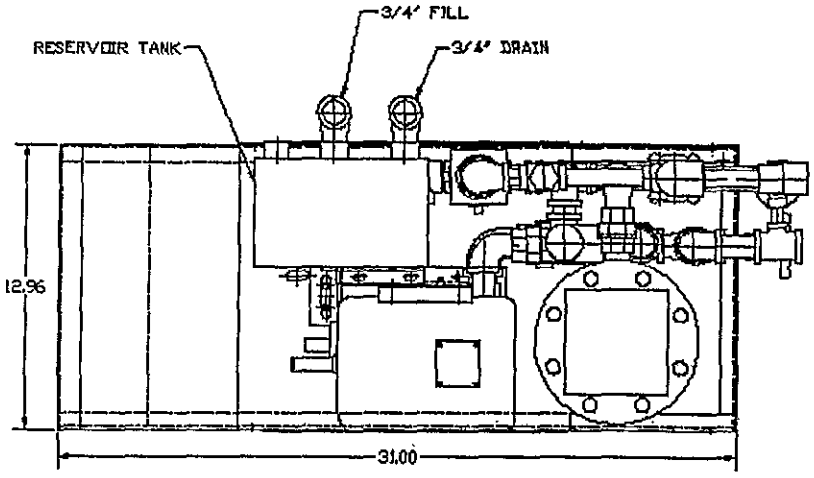
Clean out the strainer twice a year, as a minimum, depending upon usage and operating conditions.

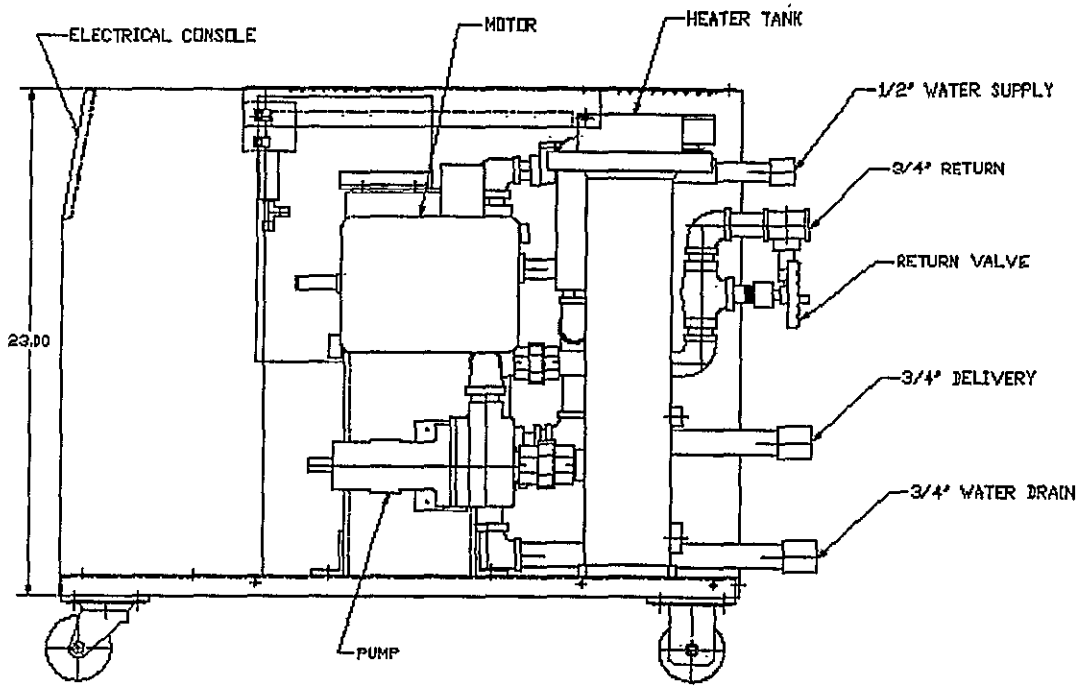
CONNECTION LINES

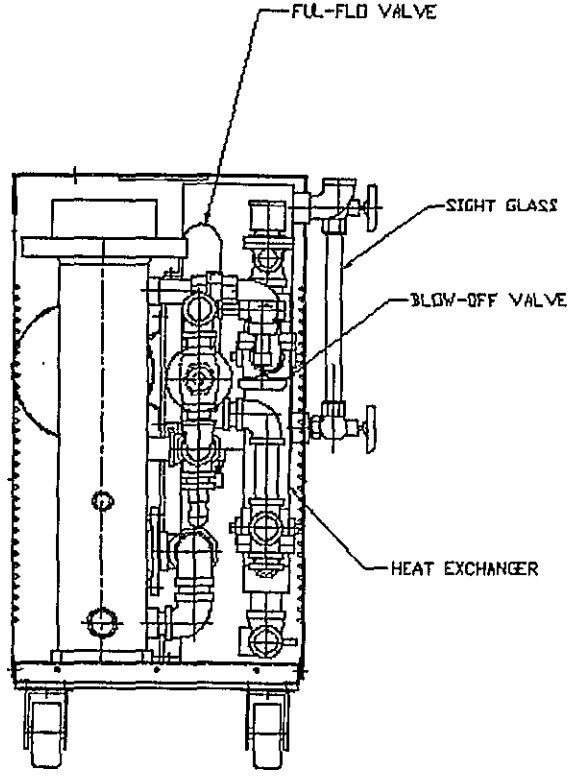
Connection line, hoses and connectors should be inspected frequently to ensure that the original service rating has not been reduced by age, damage, and/or deterioration.

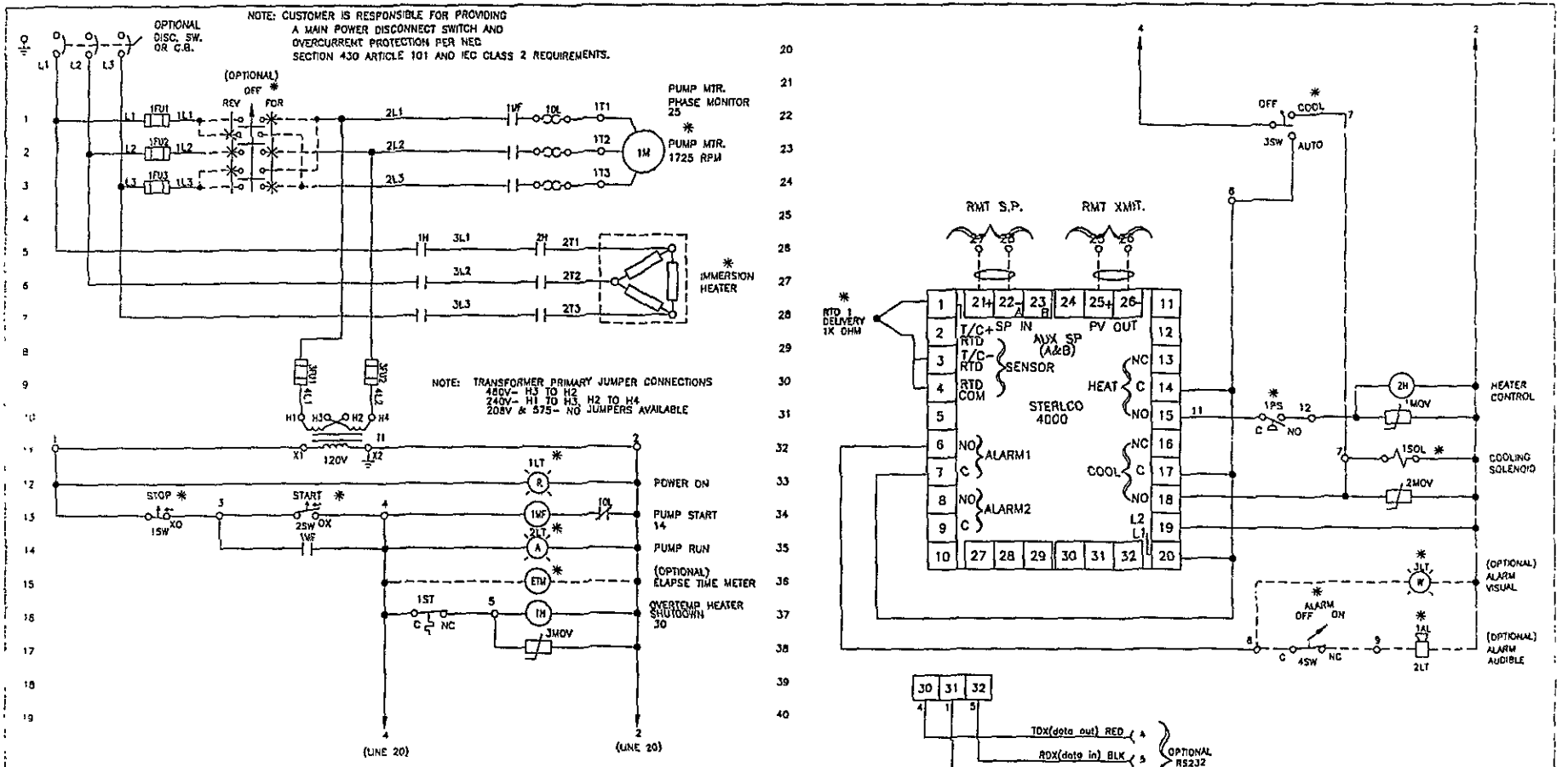
TROUBLE SHOOTING

PROBABLE CAUSE	PROBABLE REMEDY
RAPID DROP IN PRESSURE	
a. Leaks in connection lines.	a. Check all connecting lines.
b. Air in circulation lines.	b. Refer to "Start-up" procedures.
c. Low fluid.	c. Check sight gauge glass.
d. Ful-flo valve.	d. Broken spring, valve stuck open.
e. Pressure line.	e. Check for broken lines, loose connections
NO PRESSURE	
a. Water in circulating lines.	a. Refer to "Start-up" procedures for venting sequence, which should be performed at a temp. of approx. 225° F.
HEATING and COOLING	
a. Low or no water.	a. Check pressure of water supply line.
b. Throttle valve closed.	b. Adjust the valve.
c. Blow off valve in-operable.	c. Close valve tight.
d. Solenoid valve in-operable	d. Check valve for proper operation. Watch the drain line.
e. Clogged strainer.	e. Dirt from strainer entered solenoid valve.
f. Clogged drain line.	f. Disconnect and check the line.
g. Plugged heat exchanger.	g. Examine heat exchanger.
COOLING TOO FAST	
a. Solenoid valve dirty.	b. Check the valve for proper operation. Watch the drain line.
COOLING TOO SLOW	
a. Heat Exchanger	a. Flush the water circuit with descaler.
b. Solenoid valve dirty.	b. Check the valve for proper operation. Watch the drain line.


3/4" FILL
RESERVOIR TANK
3/4" DRAIN
12.96
31.00


ELECTRICAL CONSOLE
MOTOR
HEATER TANK
1/2" WATER SUPPLY
3/4" RETURN
RETURN VALVE
23.00
3/4" DELIVERY
3/4" WATER DRAIN
PUMP


FUL-FLO VALVE
SIGHT GLASS
BLOW-OFF VALVE
HEAT EXCHANGER



NOTES:
1) * INDICATES A DEVICE NOT MOUNTED ON THE ELECTRIC PANEL.
2) LAST WIRE NO. USED: 30.

MOTOR AMPS @ VOLTAGE 1725RPM						
HP	208	240	380	415	480	575
3/4	3.2	3.0	1.8	1.7	1.5	1.2
1	3.6	3.4	1.9	1.8	1.7	1.4
1.5	5.0	4.8	2.9	2.6	2.4	1.9
2	6.3	6.0	3.6	3.3	3.0	2.4
3	9.5	8.6	5.0	4.6	4.3	3.3

MOTOR FUSE SIZE CLASS "CC"						
HP	208	240	380	415	480	575
3/4	6.0	6.0	4.0	4.0	3.0	2.5
1	8.0	7.5	4.0	4.0	3.0	3.0
1.5	9.0	9.0	6.0	5.0	5.0	4.0
2	12.0	12.0	7.5	8.0	8.0	5.0
3	20.0	20.0	9.0	9.0	8.0	8.0

COMPONENT WATT RATING					
NEMA CONTACTORS	O.P. CONTACTORS	IEC CONTACTORS	RELAYS	SOLENOIDS	LAMPS
00,0,1 24W	40A 4.4W	A09,A12 8.5VA / A16,A26 8 VA	4PDT .9W	1/4" 10.1W	FULL VOLT .3W
2 60W	60A 6W	A50,A75 .3VA / A110 84VA / A180 72VA	2DPT 1.2W	1/2" 10.1W	TRANSFORMER 1.5W
3 82.5W	90A 15W	A250,A300 13VA / A400 180VA / A500 216VA	MACH. TOOL 7W	3/4",1" 8.1W	101 INCAND .5W

HEATER AMPS @ VOLTAGE						
KW	208	240	380	415	480	600
6	17	15	9	8	7	6
12	33	28	18	17	14	12
18	50	43	27	25	22	17
24	67	58	37	33	29	23

HEATER FUSE SIZE @ VOLTAGE						
KW	208	240	380	415	480	600
6	25	20	12	10	10	10
12	45	40	25	25	20	15
18	70	60	35	35	30	25
24	90	80	50	45	40	30

MAIN PROTECTION						
KW	208	230	380	415	480	575
6	25	25	15	15	15	10
12	80	50	30	30	25	20
18	80	70	45	40	35	30
24	100	90	60	50	45	35

CLASS "CC" FUSE							
TRANS	PRIMARY FUSE SIZE						SECONDARY FUSE
VA	208	240	380	415	480	575	IF REQ'D
100	1.0	.8	.5	.5	.5	.5	1.6 AMP
150	1.0	1.0	.3	.5	.5	.4	1.6 AMP
250	1.5	1.5	1.0	.8	.8	.8	2.8 AMP

REVISION	UNLESS OTHERWISE SPECIFIED TOLERANCE	
	DIA. DRILL AS	TOL.
	x/x	31/64
	X.	±.040
	X.x	±.020
	X.xx	±.010
	X.xxx	±.005

FINISH TO BE 125 ANGLES ±1/2 DEG

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DATE	DRAWN	SCALE
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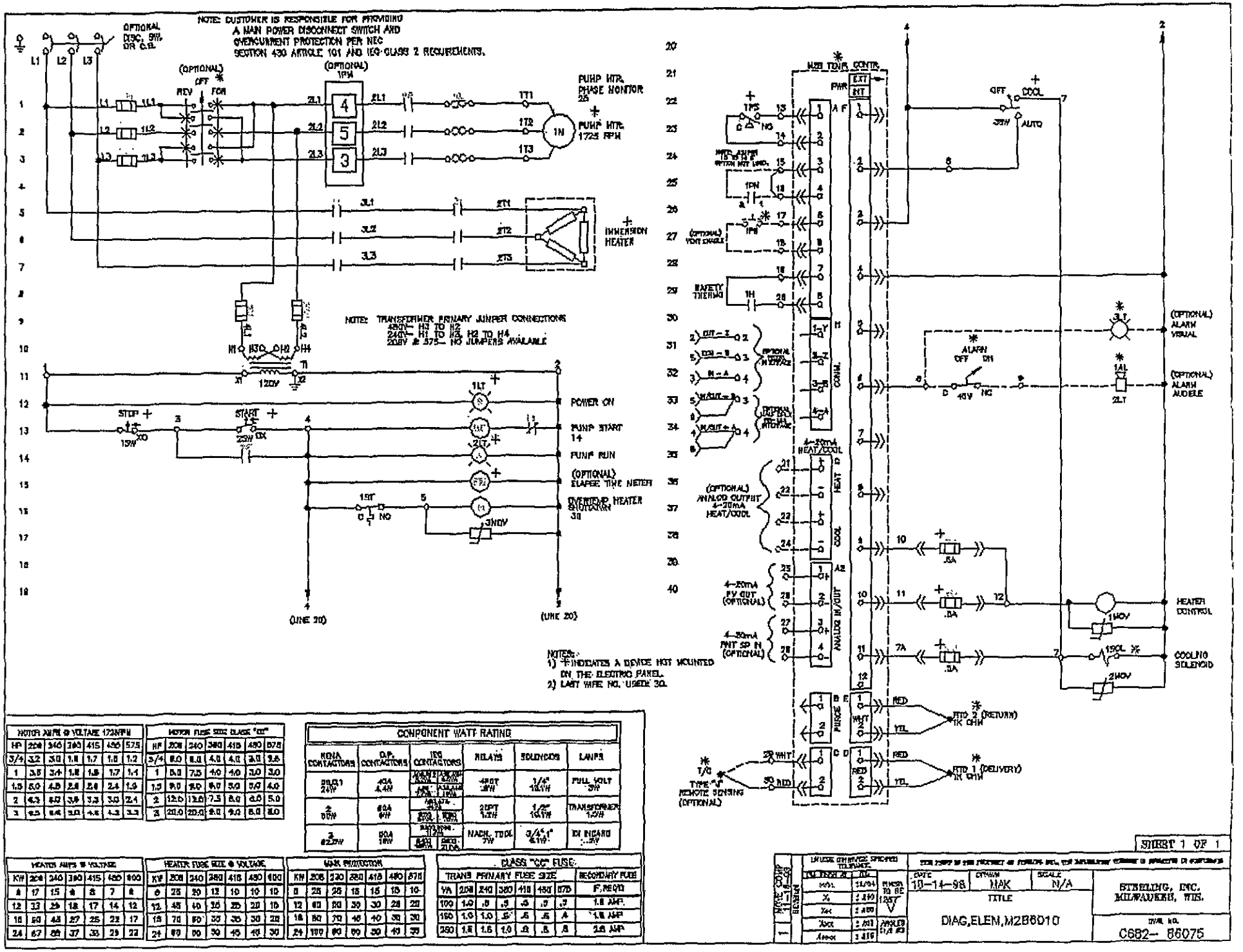
TITLE: DIAG,ELEM,6010,STERLCO,4000

STERLING, INC. MILWAUKEE, WIS.

DWG. NO. C682- 86193

SHEET 1 OF 1



MOTOR AMPS @ VOLTAGE 1725RPM						
HP	208	240	380	415	480	575
3/4	3.2	3.0	1.8	1.7	1.5	1.2
1	3.8	3.4	1.8	1.8	1.7	1.4
1.5	5.0	4.8	2.8	2.6	2.4	1.9
2	6.4	6.2	3.6	3.3	3.0	2.4
3	8.5	8.6	5.0	4.6	4.3	3.3

MOTOR FUSE SIZE CLASS "RK"						
HP	208	240	380	415	480	575
3/4	8.0	8.0	4.0	4.0	3.0	3.0
1	8.0	7.5	4.0	4.0	3.0	3.0
1.5	9.0	9.0	9.0	5.0	7.0	4.0
2	12.0	12.0	7.5	8.0	6.0	5.0
3	20.0	20.0	9.0	9.0	8.0	8.0

COMPONENT WATT RATING					
NEMA CONTACTORS	D.P. CONTACTORS	IEC CONTACTORS	RELAYS	SOLENOIDS	LAMPS
SIZE 1 24W	40A 4.4W		4PDT 3W	1/4" 10.1W	FULL VOLT 3W
2 60W	60A 9W		2PDT 1.2W	1/2" 10.1W	TRANSFORMER 1.2W
3 62.5W	90A 18W		MACH. TOOL 7W	3/4"-1" 8.1W	IN RIGGARD

HEATER AMPS @ VOLTAGE						
KW	208	240	380	415	480	600
6	17	15	9	8	7	6
12	33	29	18	17	14	12
18	50	43	27	25	23	17
24	67	58	37	33	29	22

HEATER FUSE SIZE @ VOLTAGE						
KW	208	240	380	415	480	600
6	25	20	12	10	10	10
12	45	40	25	25	20	15
18	70	60	35	35	30	25
24	90	90	50	45	40	30

MAIN PROTECTION						
KW	208	230	380	415	480	575
6	25	25	15	15	15	10
12	60	50	30	30	25	20
18	80	70	40	40	30	30
24	100	90	60	50	40	35

CLASS "CC" FUSE						
TRANS PRIMARY FUSE SIZE						SECONDARY FUSE
VA	208	240	380	415	480	575	IF REQ'D
100	1.0	.8	.5	.5	.5	.5	1.8 AMP
150	1.0	1.0	.5	.5	.5	.5	1.8 AMP
250	1.6	1.6	1.0	.8	.8	.8	2.8 AMP

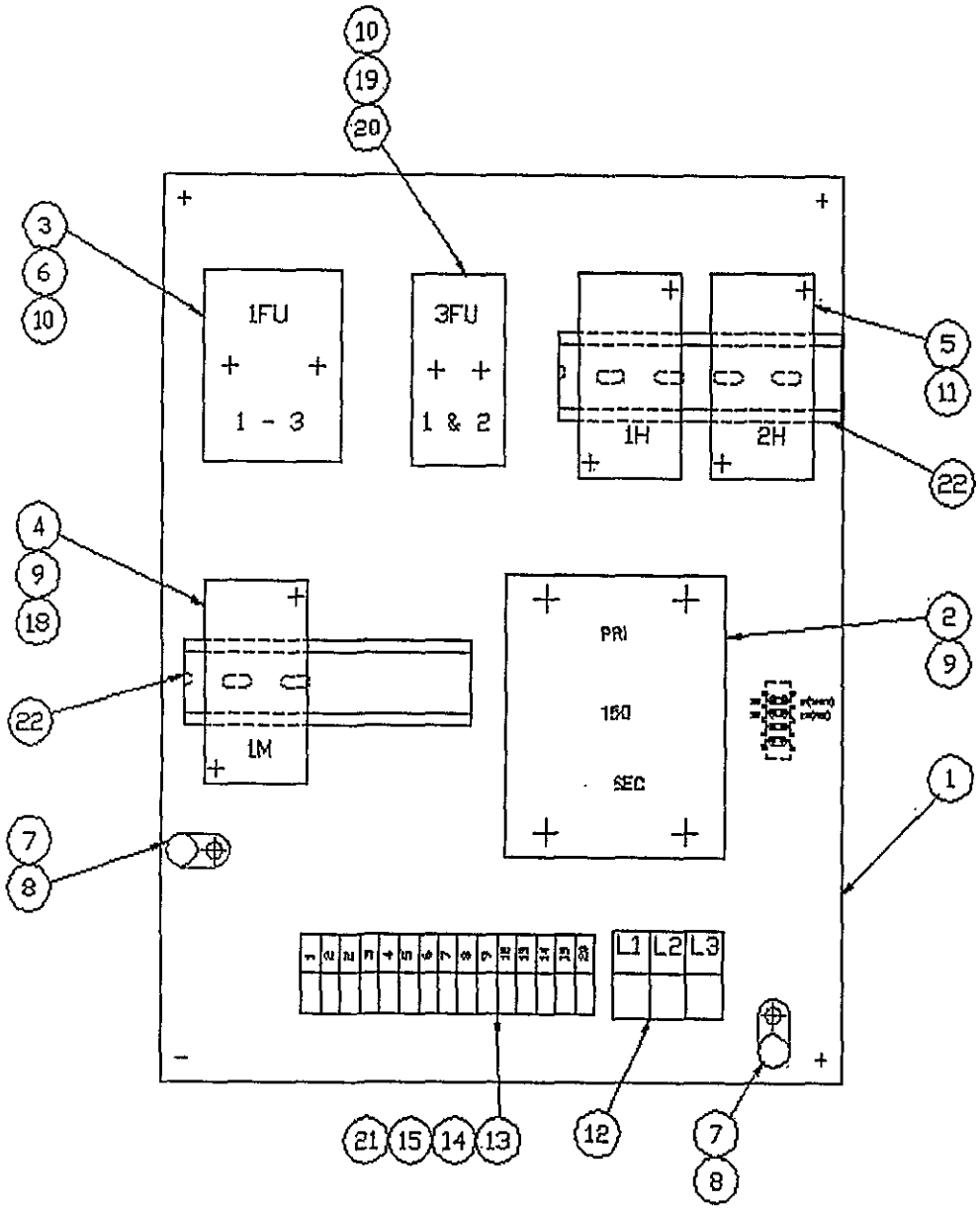
SHEET 1 OF 1

DATE	DRAWN	SCALE
10-14-98	MAK	N/A

TITLE: DIAG,ELEM,M2B6010

STERLING, INC. MILWAUKEE, WIS.

DWG NO. C682- 86075



ITEM	REQ'D	DESCRIPTION	PART NO.
1	1	PNL,E	522-80999-00
2	1	TFMR,CNTL,150VA,____	704-000___-00
3	1	FB,CC,3P,600V,30AMP	725-00615
4	1	CONT,9A,600V,120V	728-00175-02
5	2	CONT,____,600V,120V,COIL	728-00___-02
6	3	FUSE,CC,600V,__AMP	725-00___-00
7	2	TERM,LUG,#14-4,CND,1/4	703-00029
8	2	SCRW,THD,ROL,HEX,HD,SLOT	150-00207
9	7	SCRW,THD,ROL,HEX,HD,SLOT	150-00209
10	4	SCRW,THD,ROL,HEX,HD,SLOT	150-00212
11	4	RHMS,10-24X1/2	001-01389
12	3	TB,TRK,MTD,100AMP,600V,3POLE	719-00037
13	5	TB,TRK,MTD,30AMP,600V,3POLE	719-00031
14	.25'	TB,TRK,MTD,37-1/2LG	719-00020
15	2	SCRW,THD,ROL,HEX,HD,#8-32X1/2	150-00008
16	10	WR,14,RED,THHN,STRD	700-00036
17	10	WR,12,BLK,THHN,STRD	700-00057
18	1	O.L. ELEMENT	731-00___-02
19	1	FB,CC,2P,600V,30AMP	725-00749
20	2	FUSE,CC,600V,0.50AMP	725-00___
21	.5'	TB,TRK,MTD,MARK,STRP	719-00023
22	.1	TRK,DIN,1 MTER	162-00009-04

2

TRANSFORMER						
KW	208	240	380	415	480	575
6	60	52	60	58	52	54

20

TRANSFORMER PRIMARY FUSES						
KW	208	240	380	415	480	575
6	753	753	751	751	751	751

6

MOTOR FUSING						
HP	208	240	380	415	480	575
3/4	761	761	759	758	758	757

5

HEATER CONTACTORS 3PH						
KW	208	240	380	415	480	575
6	180	179	178	177	177	177

18

MOTOR OVERLOAD						
HP	208	240	380	415	480	575
3/4	256	258	256	258	256	255

SHEET 1 OF 1

DATE	DRAWN	SCALE
11-18-85	JNO	1/2

TITLE

PNL,E,SA,6010,GNRC,CTR

STERLING, INC.
MILWAUKEE, WIS.

DWG NO.
C692-86195-00

REPAIR PARTS LIST
MODEL: 6010

PUMPS

075-00381-00	MECHANICAL SEAL
075-00304-00	PACKED SEAL
075-00043-00	DRIP PUMP

MOTORS

720-09217-00	3/4HP, 3/60/208,230,460V

IMMERSION HEATERS

722-00137-33	6kW, 208V
722-00137-27	6kW, 230V
722-00137-32	6kW, 460V
722-00137-37	6kW, 575V

HEATER TANK GASKET

542-00007-08

FUL-FLO VALVE

044-00292-00

PRESSURE RELIEF VALVE

044-00138-00

SAFETY THERMOSTAT (SET 420°F)

692-09294-00

CONTROLLER

601-00521-05	"M2B"	CTR,M2B,400F
724-00589-01	"Sterlco 4000"	CTR,.25,RTD/TC,RLY,RLY

PRESSURE SWITCH

733-00029-00	PS,SPDT,11A,250VAC

TEMPERATURE PROBES

701-00036-00	SEN,TC,K

SIGHT GAUGE

162-00017-01	GLASS ONLY
037-00046-00	GAUGE GLASS ASSEMBLY

HEAT EXCHANGER

106-00024-00	1.5 SQ. FT.

SOLENOID

732-00013-00	3/4', 120V
732-00072-00	1/2" 120V

CASTERS

042-00016-00	3" SWIVEL
042-00017-00	3" STATIONARY

ELECTRICAL COMPONENTS

CONTACTOR

726-00177-02	CONT,18A,600V,120V,COIL
726-00178-02	CONT,24A,600V,120V,COIL
726-00179-02	CONT,30A,600V,120V,COIL
726-00180-02	CONT,38A,600V,120V,COIL

MOTOR STARTER

726-00005-02	SIZE "00"	Older Models
726-00175-02	CONT,9A,600V,120V,COIL	

TRANSFORMER

704-00052-00	230V/460V PRIMARY

CONTROL FUSE

725-00753-00	FUSE,CC,600V,1AMP (230V PRIMARY)
725-00751-00	FUSE,CC,600V,0.50AMP (460V PRIMARY)
725-00600-00	#FNM 1.6A (230V PRIMARY) (460V PRIMARY)

MOTOR FUSE

725-00761-00	FUSE,CC,600V,6AMP (3/4HP @ 230V)
725-00758-00	FUSE,CC,600V,3AMP (3/4HP @ 460V)
725-00561-00	#FRS 7A (3/4HP @ 230V)
725-00566-00	#FRS 4A (3/4HP @ 460V)

SELECTOR SWITCH

717-10028-00	SW,ROCK,2POS,WHT,1PST,MOM,NO
717-10029-00	SW,ROCK,2POS,WHT,1PST,MANT
717-10034-00	SW,ROCK,3POS,WHT,1PDT,MANT
717-10039-00	SW,ROCK,2POS,RED,1PDT,MOM

PILOT LIGHTS

715-10036-00	PLT,MISC,AMBR,120VAC
715-10037-00	PLT,MISC,RED,120VAC

NOTE: PLEASE GIVE MODEL AND SERIAL NUMBERS WHEN ORDERING PARTS. PART NUMBERS ARE LISTED AS A GUIDE, BUT MANY UNITS HAVE SPECIAL PARTS OR FEATURES NOT COVERED BY THIS LIST.